Form Approved. O.M.B. No. 2070-0012. Approval Expires 10-31-96

U.S. ENVIRONMENTAL PROTECTION AGENCY

PREMANUFACTURE

AGENCY USE ONLY

Date of receipt

5 1 0 9 0 0 0 0 6 3 2 / S

When completed send this form to

U.S. E.P.A. 1200 Pennsylvania, NW
WASHINGTON, D.C. 20460

Company Sanitized

Enter the total number of pages in the Premanufacture Notice ▶ 18

Document control number 51090000632

EPA case number P09-632

TS - C S 1 1 L U

GENERAL INSTRUCTIONS

- You must provide all information requested in this form to the extent that it is known to or reasonably ascertainable by you. Make reasonable estimates if you do not have actual data.
- Before you complete this form, you should read the "Instructions Manual for Premanufacture Notification" (the Instructions Manual is available from the Toxic Substances Control Act (TSCA) Information Service by calling 202-554-1404, or faxing 202-554-5603).
- If a user fee has been remitted for this notice (40 CFR 700.45), indicate in the boxes above the TS-user fee identification number you have generated. Remember, your user fee ID number must also appear on your corresponding fee remittance, which is sent to EPA, Washington Financial Management Center (3303), P.O. 360399M, Pittsburgh, PA 15251-6399, Attn: TSCA User fee.

Part I — GENERAL INFORMATION

You must provide the currently correct Chemical Abstracts (CA) Name of the new chemical substance, even if you claim the identity as confidential. You may authorize another person to submit chemical identity information for you, but your submission will not be complete and the review will not begin until EPA receives this information. A letter in support of your submission should reference your TS user fee identification number. You must submit an original and two copies of this notice including all test data. If you claimed any information as confidential, a single sanitized copy must also be submitted.

Part II — HUMAN EXPOSURE AND ENVIRONMENTAL RELEASE

If there are several manufacture, processing, or use operations to be described in Part II, sections A and B of this notice, reproduce the sections as needed.

Part III — LIST OF ATTACHMENTS

Attach additional sheets if there is not enough space to answer a question fully. Label each continuation sheet with the corresponding section heading. In Part III, list these attachments, any test data or other data and any optional information included in the notice.

OPTIONAL INFORMATION

You may include any information that you want EPA to consider in evaluating the new substance. On page 11 of this form, space has been provided for you to describe pollution prevention and recycling information you may have regarding the new substance.

So-called "binding" boxes are included throughout this form for you to indicate your willingness to be bound to certain statements you make in this section, such as use, production volume, protective equipment . . . This option is intended to reduce delays that routinely accompany the development of consent orders or Significant New Use Rules. Except in the case of exemption applications (such as TMEA, LVE, LOREX) where certain information provided in such notification is binding on the submitter when the Agency approves the exemption application, checking a binding box in this notice does not by itself prohibit the submitter from later deviating from the information (except chemical identity) reported in the form.

CONFIDENTIALITY CLAIMS

You may claim any information in this notice as confidential. To assert a claim on the form, mark (X) the confidential box next to the information that you claim as confidential. To assert a claim in an attachment, circle or bracket the information you claim as confidential. If you claim information in the notices as confidential, you must also provide a sanitized version of the notice, (including attachments). For additional instructions on claiming information as confidential, read the Instructions Manual.

[X] Mark (x) if any information in this notice is claimed as confidential.

TEST DATA AND OTHER DATA

You are required to submit all test data in your possession or control and to provide a description of all other data known to or reasonably ascertainable by you, if these data are related to the health and environmental effects on the manufacture, processing, distribution in commerce, use, or disposal of the new chemical substance. Standard literature citations may be submitted for data in the open scientific literature. Complete test data (written in English), not summaries of data, must be submitted if they do not appear in the open literature. You should clearly identify whether test data is on the substance or on an analog. Also, the chemical composition of the tested material should be characterized. Following are examples of test data and other data. Data should be submitted according to the requirements of §720.50 of the Premanufacture Notification Rule (40 CFR Part 720).

Test Data (Check Below any included in this notice)

- Environmental fate data [ ] Yes
- Health effects data [ ] Yes
- Environmental effects data [ ] Yes
- Physical/Chemical Properties* [X] Yes
- Other data [ ] Yes
- Risk assessments [ ]
- Structure/activity relationships [ ]
- Test data not in the possession or control of the submitter [ ]

* A physical and chemical properties worksheet is located on the last page of this form.

TYPE OF NOTICE (Check Only One)

- [X] PMN (Premanufacture Notice)
- [ ] INTERMEDIATE PMN (submitted in sequence with final product PMN)
- [ ] SNUN (Significant New Use Notice)
- [ ] TMEA (Test Marketing Exemption Application)
- [ ] LVE (Low Volume Exemption) @ 40 CFR 723.50(c)(1)
- [ ] LOREX (Low Release/Low Exposure Exemption) @ 40 CFR 723.50(c)(2)
- [ ] LVE Modification [ ] LOREX Modification

IS THIS A CONSOLIDATED PMN? [ ] Yes

# of chemicals or polymers 1
(Prenotice Communication # required, enter # on page 3)

321552

CERTIFICATION -- A Printed copy of this signature page, with original signature, must be submitted

I certify that to the best of my knowledge and belief:

1. The company named in Part I, section A, subsection 1a of this notice form intends to manufacture or import for a commercial purpose, other than in small quantities solely for research and development, the substance identified in Part I, Section B.
2. All information provided in this notice is complete and truthful as of the date of submission.
3. I am submitting with this notice all test data in my possession or control and a description of all other data known to or reasonably ascertainable by me as required by §720.50 of the Premanufacture Notification Rule.

Additional Certification Statements:

If you are submitting a PMN, Intermediate PMN, Consolidated PMN, or SNUN, check the following **user fee** certification statement that applies:

☐ The Company named in Part I, Section A has remitted the fee of $2500 specified in 40 CFR 700.45(b), or

☐ The Company named in Part I, Section A has remitted the fee of $1000 for an Intermediate PMN (defined @ 40 CFR 700.43) in accordance with 40 CFR 700.45(b), or

☒ The Company named in Part I Section A is a small business concern under 40 CFR 700.43 and has remitted a fee of $100 in accordance with 40 CFR 700.45(b).

If you are submitting a **low volume exemption (LVE)** application in accordance with 40 CFR 723.50(c)(1) or a **Low release and low exposure exemption (LoRex)** application in accordance with 40 CFR 723.50(c)(2), check the following certification statements:

☐ The manufacturer submitting this notice intends to manufacture or import the new chemical substance for commercial purposes, other than in small quantities solely for research and development, under the terms of 40 CFR 723.50.

☐ The manufacturer is familiar with the terms of this section and will comply with those terms; and

☐ The new chemical substance for which the notice is submitted meets all applicable exemption conditions.

☐ If this application is for an LVE in accordance with 40 CFR 723.50(c)(1), the manufacturer intends to commence manufacture of the exempted substance for commercial purposes within 1 year of the date of the expiration of the 30 day review period.

The accuracy of the statements you make in this notice should reflect your best prediction of the anticipated facts regarding the chemical substance described herein. Any knowing and willful misinterpretation is subject to criminal penalty pursuant to 18 USC 1001.

Signature and title of Authorized Official (Original Signature Required)	Date	Confidential
[signature]	August 31, 2009	☐
Signature of agent - (if applicable)	Date	☐

Part I -- GENERAL INFORMATION

Section A -- SUBMITTER IDENTIFICATION

Mark () the "Confidential" box next to any subsection you claim as confidential

Confi-dential

1a. Person Submitting Notice (in U.S.)

Name of authorized official: Marc Lebel

Position: President and CEO

Company: FRX Polymers, Inc.

Mailing address (number and street): 200 Turnpike Road

City, State: Chelmsford, MA

Postal Code: 01824

b. Agent (if applicable)

Name of authorized official

Position

Company

Mailing address (number and street)

City, State

Postal Code

Telephone (include area code)

c. If you are submitting this notice as part of a joint submission, mark (X) this box. →

Joint Submitter (if applicable)

Name of authorized official

Position

Company

Mailing address (number and street)

City, State

Province, Country

Postal Code

Telephone (include country or area code)

2. Technical Contact (in U.S.)

Name of authorized official: Lawino Kagumba, PhD

Position: Director, R & D

Company: FRX Polymers, Inc.

Mailing address (number and street): 200 Turnpike Road

City, State: Chelmsford, MA

Postal Code: 01824

Telephone (include area code): 978-856-4155

3. If you have had a prenotice communication (PC) concerning this notice and EPA assigned a PC Number to the notice, enter the number. → Mark (X) if none → [X]

4. If you previously submitted an exemption application for the chemical substance covered by this notice, enter the exemption number assigned by EPA. If you previously submitted a PMN for this substance enter the PMN number assigned by EPA (i.e. withdrawn or incomplete). → Mark (X) if none → [X]

5. If you have submitted a notice of Bona fide intent to manufacture or import for the chemical substance covered by this notice, enter the notice number assigned by EPA. → Mark (X) if none → [X]

6. Type of Notice - Mark (X)

1. [ ] Manufacture Only — [ ] Binding Option Mark (X)
2. [X] Import Only — [ ] Binding Option Mark (X)
3. [ ] Both

Part I -- GENERAL INFORMATION -- Continued

Section B -- CHEMICAL IDENTITY INFORMATION: You must provide a currently correct Chemical Abstracts (CA) name of the substance based on the ninth Collective Index (9CI) of CA nomenclature rules and conventions.

Mark (X) the "Confidential" box next to any item you claim as confidential

Complete either item 1 (Class 1 or 2 substances) or 2 (Polymers) as appropriate. Complete all other items.

If another person will submit chemical identity information for you (for either Item 1 or 2), mark (X) the box at the right. Identify the name, company, and address of that person in a continuation sheet. → ☐

Confi-dential

1. Class 1 or 2 chemical substances (for definitions of class 1 and class 2 substances, see the Instructions Manual)

   a. Class of substance - Mark (X) ☐ Class 1 or ☐ Class 2 — Confi-dential ☐

   b. Chemical name (Currently correct Chemical Abstracts (CA) Name that is consistent with TSCA Inventory listings for similar substances. For Class 1 substances a CA Index Name must be provided. For Class 2 substances either a CA Index Name or CA Preferred Name must be provided, which ever is appropriate based on CA 9CI nomenclature rules and conventions). — Confi-dential ☐

   c. Please identify which method you used to develop or obtain the specified chemical identity information reported in this notice. (check one).

   ☐ Method 1 (CAS Inventory Expert Service - a copy of the Identification report obtained from the CAS Inventory Expert Services must be submitted as an attachment to this notice)

   ☐ Method 2 (Other Source)

   d. Molecular formula — CBI ☐ — CAS Registry Number (if a number already exists for the substance) — Confi-dential ☐

   e. For a class 1 substance, provide a complete and correct chemical structure diagram. For a class 2 substance, provide a correct representative or partial chemical structure diagram, as complete as can be known, if one can be reasonably ascertained. Please see the E-PMN Instruction Manual for discussion of "native format" diagram software which can be helpful in reviewing your substance. — Confi-dential ☐

☐ Mark (X) this box if you attach a continuation sheet.

For a class 2 substance - (1) List the immediate precursor substances with their respective CAS Registry Numbers. (2) Describe the nature of the reaction or process. (3) Indicate the range of composition and the typical composition (where appropriate).

e. (1) List the immediate precursor substances with their respective CAS Registry Numbers.
Name (CAS #)

Confi-dential ☐

e. (2) Describe the nature of the reaction or process.

☐

e. (3) Indicate the range of composition and the typical composition (where appropriate).

☐

☐ Mark (X) this box if you attach a continuation sheet.

Part I -- GENERAL INFORMATION -- Continued

Section B -- CHEMICAL IDENTITY INFORMATION -- Continued

2. Polymers (For a definition of polymer, see the Instructions Manual.)

	Confi-dential
a. Indicate the number-average weight of the lowest molecular weight composition of the polymer you intend to manufacture. Indicate maximum weight percent of low molecular weight species (not including residual monomers, reactants, or solvents) below 500 and below 1,000 absolute molecular weight of that composition.	X

Describe the methods of measurement or the basis for your estimates: GPC ☐ Other ☐ (Specify below)

(i) lowest number average molecular weight: _____

(ii) maximum weight % below 500 molecular weight: _____

(iii) maximum weight % below 1000 molecular weight: _____

☐ Mark (X) this box if you attach a continuation sheet.

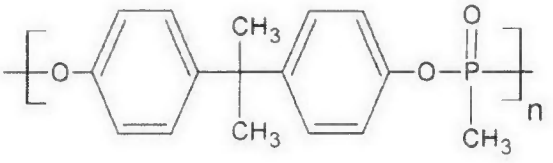
b. You must make separate confidentiality claims for monomer or other reactant identity, composition information, and residual information. Mark (X) the "Confidential" box next to any item you claim as confidential.

(1) - Provide the specific chemical name and CAS Registry Number (if a number exists) of each monomer or other reactant used in the manufacture of the polymer.
(2) - Mark (X) this column if entry in column (1) is confidential.
(3) - Indicate the typical weight percent of each monomer or other reactant in the polymer.
(4) - Choose "yes" from drop down menu if you want a monomer or other reactant used at two weight percent or less to be listed as part of the polymer description on the TSCA Chemical Substance Inventory.
(5) - Mark (X) this column if entries in columns (3) and (4) are confidential.
(6) - Indicate the maximum weight percent of each monomer or other reactant that may be present as a residual in the polymer as manufactured for commercial purposes.
(7) - Mark (X) this column if entry in column (6) is confidential.

Monomer or other reactant and CAS Registry Number (1)	Confi-dential (2)	Typical composition (3)	Include in identity (4)	Confi-dential (5)	Maximum residual (6)	Confi-dential (7)
	X	%	Yes	X	%	X
	X	%	Yes	X	%	X
		%			%	
		%			%	
		%			%	
		%			%	
		%			%	
		%			%	
		%			%	
		%			%	
		%			%	
		%			%	
		%			%	

☐ Mark (X) this box if you attach a continuation sheet.

	CBI
c. Please identify which method you used to develop or obtain the specified chemical identity information reported in this notice (check one). [X] Method 1 (CAS Inventory Expert Service - a copy of the identification report obtained from CAS Inventory Expert Service must be submitted as an attachment to this notice) [ ] Method 2 (other source)	[X]
d. The currently correct Chemical Abstracts (CA) name for the polymer that is consistent with TSCA Inventory listings for similar polymers. polyphosphonate	[X]
CAS Registry Number (if a number already exists for the substance) 68664-06-2	[ ]
e. Provide a correct representative or partial chemical structure diagram, as complete as can be known, if one can be reasonably ascertained. Please see the E-PMN Instruction Manual for discussion of "native format" diagram software which can be helpful in reviewing your substance.	[ ]



Click on Add Picture button to add PDF illustration

[ ] Mark (X) this box if you attach a continuation sheet.

Part I -- GENERAL INFORMATION -- Continued

Section B -- CHEMICAL IDENTITY INFORMATION -- Continued

3. Impurities

(a) - Identify each impurity that may be reasonably anticipated to be present in the chemical substance as manufactured for commercial purpose. Provide the CAS Registry Number if available. If there are unidentified impurities, enter "unidentified."

(b) - Estimate the maximum weight % of each impurity. If there are unidentified impurities, estimate their total weight %.

Impurity and CAS Registry Number (a)	Maximum percent (b)	Confidential
	%	X
	%	X
	%	X
	%	X
	%	
	%	
	%	

X Mark (X) this box if you attach a continuation sheet.

4. Synonyms - Enter any chemical synonyms for the new chemical identified in subsection 1 or 2.

Confidential

☐ Mark (X) this box if you attach a continuation sheet.

5. Trade identification - List trade names for the new chemical substance identified in subsection 1 or 2.

FRX 100 Homopolymer

Confidential

☐ Mark (X) this box if you attach a continuation sheet.

6. Generic chemical name - If you claim chemical identity as confidential, you must provide a generic name for your substance that reveals the specific chemical identity of the new chemical substance to the maximum extent possible. Refer to the TSCA Chemical Substance Inventory, 1985 Edition, Appendix B for guidance on developing generic names.

polyphosphonate

☐ Mark (X) this box if you attach a continuation sheet.

7. Byproducts - Describe any byproducts resulting from the manufacture, processing, use, or disposal of the new chemical substance. Provide the CAS Registry Number if available.

Byproduct (1)	CAS Registry Number (2)	Confidential
		X

☐ Mark (X) this box if you attach a continuation sheet.

Part I -- GENERAL INFORMATION -- Continued

Section C -- PRODUCTION, IMPORT, AND USE INFORMATION:

Mark (X) the "Confidential" box next to any item you claim as confidential.

1. **Production volume** -- Estimate the **maximum** production volume during the first 12 months of production. Also estimate the maximum production volume for any consecutive 12-month period during the first three years of production. Estimates should be on 100% new chemical substance basis. For a Low Volume Exemption application, if you choose to have your notice reviewed at a lower production volume than 10,000 kg/yr, specify the volume and mark (x) in the binding box. If granted, you are bound to this volume

Maximum first 12-month production (kg/yr) (100% new chemical substance basis)	Maximum 12-month production (kg/yr) (100% new chemical substance basis)	Confi-dential	Binding Option Mark (x)
		X	

2. **Use Information** -- You must make separate confidentiality claims for the description of the category of use, the percent of production volume devoted to each category, the formulation of the new substance, and other use information. Mark (X) the "Confidential" Box next to any item you claim as confidential.

a. (1) --Describe each intended category of use of the new chemical substance by function and application. (2) --Mark (X) this column if entry column (1) is confidential business information (CBI). (3) --Indicate your willingness to have the information provided in column (1) binding. (4) --Estimate the percent of total production for the first three years devoted to each category of use. (5) --Mark (X) this column if entry in column (4) is confidential business information (CBI). (6) --Estimate the percent of the new substance as formulated in mixtures, suspensions, emulsions, solutions, or gels as manufactured for commercial purposes at sites under your control associated with each category of use. (7) --Mark (X) this column if entry in column (6) is confidential business information (CBI). (8) --Indicate % of product volume expected for the listed "use" sectors. Mark more than one box if appropriate. Mark (X) to indicate your willingness to have the use type provided in (8) binding. (9) --Mark (X) this column if entry(ies) in column (8) is (are) confidential business information (CBI).

Category of use (1) (by function and application i.e. a dispersive dye for finishing polyester fibers)	CBI (2)	Binding Option Mark (x) (3)	Prod-uction % (4)	CBI (5)	% in Formu lation (6)	CBI (7)	% of substance expected per use (8)					CBI (9)
							Site-limited	Cons-umer	Indus-trial	Com-mercial	Binding Option	
	X		%	X	%	X						X
	X		%	X	%	X						X
			%		%							
			%		%							
			%		%							
			%		%							
			%		%							

* If you have identified a "consumer" use, please provide on a continuation sheet a detailed description of the use(s) of this chemical substance in consumer products. In addition include estimates of the concentration of the new chemical substance as expected in consumer products and describe the chemical reactions by which this substance loses its identity in the consumer product.

☐ Mark (X) this box if you attach a continuation sheet.

b. Generic use description -- If you claim any category of use description in subsection 2a as confidential, enter a generic description of that category. Read the Instruction Manual for examples of generic use descriptions.

FRX 100 is a non-halogenated polyphosphonate flame retardant polymer that addresses the need to replace the current commercial bromine-containing flame retardants that are being phased out due to environmental regulation. Flame retardants are required to meet fire safety standards in order to reduce flammability of combustible materials.

☐ Mark (X) this box if you attach a continuation sheet.

3. **Hazard Information** -- Include in the notice a copy of reasonable facsimile of any hazard warning statement, label, material safety data sheet, or other information which will be provided to any person who is reasonably likely to be exposed to this substance regarding protective equipment or practices for the safe handing, transport, use, or disposal of the new substance. List in part III hazard information you include.

Binding Option Mark (x)

☒ Mark (X) this box if you attach hazard information. ☐

Part II-- HUMAN EXPOSURE AND ENVIRONMENTAL RELEASE

Section A -- INDUSTRIAL SITES CONTROLLED BY THE SUBMITTER

Mark (X) the "Confidential" box next to any item you claim as confidential

Complete section A for each type of manufacture, processing, or use operation involving the new chemical substance at industrial sites you control. Importers do not have to complete this section for operations outside the U.S.; however, you may still have reporting requirements if there are further industrial processing or use operations after import. You must describe these operations. See instructions manual

1. Operation description

a. Identity -- Enter the identity of the site at which the operation will occur. | Confidential

Name ☐

Site address (number and street)

City, County, State, ZIP code

If the same operation will occur at more than one site, enter the number of sites. Identify the additional sites on a continuation sheet, and if any of the sites have significantly different production rates or operations, include all the information requested in this section for those sites as attachments. → ☐

☐ Mark (X) this box if you attach a continuation sheet.

b. Type -- Mark (X) ☐ Manufacturing ☐ Processing ☐ Use ☐

c. Amount and Duration -- Complete 1 or 2 as appropriate

	Maximum kg/batch (100% new chemical substance)	Hours/batch	Batches/year	
1. Batch				☐
	Maximum kg/day (100% new chemical substance)	**Hours/day**	**Days/year**	
2. Continuous				☐

d. Process description ☐ Mark (X) to indicate your willingness to have your process description binding. ☐

(1) Diagram the major unit operation steps and chemical conversions. Include interim storage and transport containers (specify- e.g. 5 gallon pails, 55 gallon drum, rail car, tank truck, etc.).

(2) Provide the identity , the approximate weight (by kg/day or kg/batch on a 100% new chemical substance basis), and entry point of all starting materials and feedstocks (including reactants, solvents, catalysts, etc.), and of all products, recycle streams, and wastes. Include cleaning chemicals (note frequency if not used daily or per batch.).

(3) Identify by number the points of release, including small or intermittent releases, to the environment of the new chemical substance. If releasing to two media at the same step, assign a second release number for the second medium.

☐ Mark (X) this box if you attach a continuation sheet.

Confidential

[X]

Part II-- HUMAN EXPOSURE AND ENVIRONMENTAL RELEASE -- Continued

Section A -- INDUSTRIAL SITES CONTROLLED BY THE SUBMITTER -- Continued

2. **Occupational Exposure** -- You must make separate confidentiality claims for the description of worker activity, physical form of the new chemical substance, number of works exposed, and duration of activity. Mark (X) the "Confidential" box next to any item you claim as confidential.
   (1) -- Describe the activities (i.e. bag dumping, tote filling, unloading drums, sampling, cleaning, etc.) in which workers may be exposed to the substance.
   (2) -- Mark (X) this column if entry in column (1) is confidential business information (CBI).
   (3) -- Describe any protective equipment and engineering controls used to protect workers.
   (4) and (6) -- Indicate your willingness to have the information provided in column (3) or (5) binding.
   (5) -- Indicate the physical form(s) of the new chemical substance (e.g., solid: crystal, granule, powder, or dust) and % new chemical substance (if part of a mixture) at the time of exposure.
   (7) -- Mark (X) this column if entry in column (5) is confidential business information (CBI).
   (8) -- Estimate the maximum number of workers involved in each activity for all sites combined.
   (9) -- Mark (X) this column if entry in column (8) is confidential business information (CBI).
   (10) and (11) -- Estimate the maximum duration of the activity for any worker in hours per day and days per year.
   (12) -- Mark (X) this column if entries in columns (10) and (11) are confidential business information (CBI).

Worker activity (i.e., bag dumping, filling drums) (1)	CBI (2)	Protective Equipment/ Engineering Controls (3)	Binding Option Mark (x) (4)	Physical forms(s) and % new substance (5)	Binding Option Mark (x) (6)	CBI (7)	# of Workers Exposed (8)	CBI (9)	Maximum Hrs/day (10)	duration Days/yr (11)	CBI (12)

☐ Mark (X) this box if you attach a continuation sheet.

3. **Environmental Release and Disposal** -- You must make separate confidentiality claims for the release number and the amount of the new chemical substance released and other release and disposal information. Mark (X) the "Confidential" box next to each item you claim as confidential.
   (1) -- Enter the number of each release point identified in the process description, part II, section A, subsection 1d(3).
   (2) -- Estimate the amount of the new substance released (a) directly to the environment or (b) into control technology (in kg/day or kg/batch).
   (3) -- Mark (X) this column if entries in columns (1) and (2) are confidential business information (CBI).
   (4) -- Identify the media (stack air, fugitive air (optional-see Instruction Manual), surface water, on-site or off-site land or incineration, POTW, or other (specify)) to which the new substance will be released from that release point.
   (5) -- a. Describe control technology, if any, and control efficiency that will be used to limit the release of the new substance to the environment. For releases disposed of on land, characterize the disposal method and state whether it is approved for disposal of RCRA hazardous waste. On a continuation sheet, for each site describe any additional disposal methods that will be used and whether the waste is subject to secondary or tertiary on-site treatment. b. Estimate the amount released to the environment after control technology (in kg/day).
   (6) -- Mark (X) this column if entries in columns (4) and (5) are confidential business information (CBI).
   (7) -- Identify the destination(s) of releases to water. Please supply NPDES (National Pollutant Discharge Elimination System) numbers for direct discharges or NPDES numbers of the POTW (Publicly Owned Treatment Works). Mark (X) if the POTW name or NPDES # is confidential business information (CBI).

Release Number (1)	Amount of new substance released (2a)	(2b)	CBI (3)	Medium of release e.g. stack air (4)	Control technology and efficiency (you may wish to optionally attach efficiency data) (5a)	Binding Mark (X)	(5b)	CBI (6)
			☐			☐		☐
			☐			☐		☐
			☐			☐		☐
			☐			☐		☐
			☐			☐		☐
			☐			☐		☐
			☐			☐		☐
			☐			☐		☐
			☐			☐		☐

(7) Mark (X) the destination(s) of releases to water.		NPDES #	CBI
☐ POTW--provide name(s)			☐
☐ Navigable waterway--provide name(s)			☐
☐ Other--Specify			☐

☐ Mark (X) this box if you attach a continuation sheet.

Part II-- HUMAN EXPOSURE AND ENVIRONMENTAL RELEASE -- Continued

Section B -- INDUSTRIAL SITES CONTROLLED BY OTHERS

Complete section B for typical processing or use operations involving the new chemical substance at sites you do not control. Importers do not have to complete this section for operations outside the U.S.; however, you must report any processing or use activities after import. See the Instructions Manual. *Complete a separate section B for each type of processing, or use operation involving the new chemical substance.* If the same operation is performed at more than one site describe the typical operation common to these sites. Identify additional sites on a continuation sheet.

1(a). Operation Description -- To claim information in this section as confidential, circle or bracket the specific information that you claim as confidential. (1) -- Diagram the major unit operation steps and chemical conversions, including interim storage and transport containers (specify - e.g. 5 gallon pails, 55 gallon drums, rail cars, tank trucks, etc). On the diagram, identify by letter and briefly describe each worker activity. (2) -- Either in the diagram or in the text field 1(b) below, provide the identity, the approximate weight (by kg/day or kg/batch, on an 100% new chemical substance basis), and entry point of all feedstocks (including reactants, solvents and catalysts, etc) and all products, recycle streams, and wastes. Include cleaning chemicals (note frequency if not used daily or per batch). (3) -- Either in the diagram or in the text field 1(b) below, identify by number the points of release, including small or intermittent releases, to the environment of the new chemical substance. (4) Please enter the # of sites (remember to identify the locations of these sites on a continuation sheet):

_____
# of sites

CBI [X]

1(b). (Optional) This space is for a text description to clarify the diagram above. [X]

[X] Mark (X) this box if you attach a continuation sheet.

2. Worker Exposure/Environmental Release

(1) -- From the diagram above, provide the letter for each worker activity. Complete 2-8 for each worker activity described.
(2) -- Estimate the number of workers exposed for all sites combined.
(4) -- Estimate the typical duration of exposure per worker in (a) hours per day and (b) days per year.
(6) -- Describe physical form of exposure and % new chemical substance (if in mixture), and any protective equipment and engineering controls, if any, used to protect workers.
(7) -- Estimate the percent of the new substance as formulated when packaged or used as a final product.
(9) -- From the process diagram above, enter the number of each release point. Complete 9-13 for each release point identified.
(10) -- Estimate the amount of the new substance released (a) directly to the environment or (b) into control technology to the environment (in kg/day or kg/batch).
(12) -- Describe media of release i.e. stack air, fugitive air (optional-see Instructions Manual), surface water, on-site or off-site land or incineration, POTW, or other (specify) and control technology, if any, that will be used to limit the release of the new substance to the environment.
(14) -- Identify byproducts which may result from the operation.

(3), (5), (8), (11), (13) and (15) -- Mark (X) this column if any of the proceeding entries are confidential business information (CBI).

Letter of Activity (1)	# of Workers Exposed (2)	CBI (3)	Duration Of Exposure (4a)	(4b)	CBI (5)	Protective Equip. /Engineering Controls/Physical Form and/ % new substance (6)	% in Formulation (7)	CBI (8)
		X			X			X
		X			X			X
		X			X			X

Release Number (9)	Amount of New Substance Released (10a)	(10b)	CBI (11)	Media of Release & Control Technology (12)	CBI (13)
			X		X
			X		X

(14) -- Byproducts:

(15) X

☐ Mark (X) this box if you attach a continuation sheet.

OPTIONAL POLLUTION PREVENTION INFORMATION

To claim information in the following section as confidential circle or bracket the specific information that you claim as confidential.

In this section you may provide information not reported elsewhere in this form regarding your efforts to reduce or minimize potential risks associated with activities surrounding manufacturing, processing, use and disposal of the PMN substance. Please include new information pertinent to pollution prevention, including source reduction, recycling activities and safer processes or products available due to the new chemical substance. Source reduction includes the reduction in the amount or toxicity of chemical wastes by technological modification, process and procedure modification, product reformulation, raw materials substitution, and/or inventory control. Recycling refers to the reclamation of useful chemical components from wastes that would otherwise be treated or released as air emissions or water discharges, or land disposal. Descriptions of pollution prevention, source reduction and recycling should emphasize potential risk reduction subsequent to compliance with existing regulatory requirements and can be either quantitative or qualitative. The EPA is interested in the information to assess overall net reductions in toxicity or environmental releases and exposures, not the shifting of risks to other environmental media or non-environmental areas (e.g., occupational or consumer exposure). In addition, information on the relative cost or performance characteristics of the PMN substance to potential alternatives may be provided.

All information provided in this section will be taken into consideration during the review of this substance. See PMN Instructions Manual and Pollution Prevention Guidance manual for guidance and examples.

Optional Pollution Prevention Information (Continued) Describe the expected net benefits, such as (1) an overall reduction in risk to human health or the environment; (2) a reduction in the volume manufactured; (3) a reduction in the generation of waste materials through recycling, source reduction or other means; (4) a reduction in potential toxicity or human exposure and/or environmental release; (5) an increase in product performance, a decrease in the cost of production and/or improved operation efficiency of the new chemical substance in comparison to existing chemical substances used in similar application; or (6) the extent to which the new chemical substance may be a substitute for an existing substance that poses a greater overall risk to human health or the environment.

CBI ☐

Product information:
FRX 100 is a non-halogenated polyphosphonate flame retardant polymer that addresses the need to replace the current commercial bromine-containing flame retardants that are being phased out due to environmental regulation. On July 1st 2006, the EU issued a mandate to completely phase-out certain bromine-based flame retardants per the Restriction of Hazardous Substances (RoHS) directive. In response to these restrictions, most electrical and electronic equipment manufacturers have voluntarily banned the use of ALL bromine containing flame retardant plastics, and have began to phase out the use of bromine in their products starting in 2008. Halogen containing additives represent more than 60% of the current market demand.

Toxicity information:
FRX 100 is a polymeric flame retardant that has several advantages in toxicity reduction over some of the current commercial flame retardant (FR) additives and polymers:-
1. FRX 100 a non-halogenated thermoplastic polymer - halogenated FR additives (bromine-based compounds) are toxic and are being phased out of use as FR materials. The EU has already mandated complete phase-out of certain bromine-based flame retardants per the Restriction of Hazardous Substances (RoHS) directive issued July 1 2006.
2. FRX 100 will be utilized as a polymeric additive with high molecular weight (Mw 40,000). Therefore, it is non-volatile and non-migrating out of the host plastic after compounding, reducing possibility for human exposure. Non-polymeric additives often leach out of the host matrix and increase human exposure during use.
3. FRX 100 is a thermally stable material and does not degrade at elevated temperatures (300 °C). See attached Thermogravimetric Analysis (TGA).

Technical information:
FRX 100 homopolymer is prepared using the standard melt-condensation process that utilizes no solvents. Stoichiometric amounts of high purity monomers are used, yielding a polymer resin of high molecular weight that requires no further treatment or purification after synthesis. The by-product of the condensation process, phenol, is recyclable as a raw material ingredient for the synthesis of the bisphenol-A monomer used in the FRX 100 process.

Reuse/Recycling/Reclamation
The by-product of the melt-condensation process is phenol with 90-95% recovery and >99% purity (see attached GC-MS-2 recovered phenol). Phenol is a raw material ingredient for the synthesis of the bisphenol-A monomer (used in the FRX 100 process) and will be recycled on-site.

☐ Mark (X) this box if you attach a continuation sheet.

Part III -- LIST OF ATTACHMENTS

Attach continuation sheets for sections of the form and test data and other data (including physical/chemical properties and structure/activity information), and optional information after this page. Clearly identify the attachment and the section of the form to which it relates, if appropriate. Number consecutively the pages of any paper attachments. In the column below, enter the inclusive page numbers of each attachment. Electronic attachments can be identified by filename.
Mark (X) the "Confidential" box next to any attachment name you claim as confidential. Read the Instructions Manual for guidance on how to claim any information in an attachment as confidential. You must include with the sanitized copy of the notice form a sanitized version of any attachment in which you claim information as confidential.

#	Attachment name	Attachment Filename	Attachment page number(s)	Confi-dential
1	Material Safeta Data Sheet "FRX 100 Homopolymer"	MSDS FRX100	4	☐
2				☒
3				☒
4				☒
5				☒
6				☒
7				☒
8				☒
9				☒
10				☒
11				☒
12				☒
13				☒
14	FRX 100 PMN Continuation Sheet Part I-B3	Continuation I-B3	1	☒
15	FRX 100 PMN Continuation Sheet Part II-B3	Continuation II-Bl	1	☒
				☐
				☐
				☐
				☐
				☐
				☐
				☐
				☐
				☐
				☐

☐ Mark (X) this box if you attach a continuation sheet. Enter the attachment name and number.

PHYSICAL AND CHEMICAL PROPERTIES WORKSHEET

To assist EPA's review of physical and chemical properties data, please complete the following worksheet for data you provide and include it in the notice. Identify the property measured, the page of the notice on which the property appears, the value of the property, the units in which the property is measured (as necessary), and whether or not the property is claimed as confidential. If the attachments are electronic, give the attachment number (found on page 12) at (b). The physical state of the neat substance should be provided. These measured properties should be for the neat (100% pure) chemical substance. Properties that are measured for mixtures or formulations should be so noted (% PMN substance in __). You are not required to submit this worksheet; however, EPA strongly recommends that you do so, as it will simplify review and ensure that confidential information is properly protected. You should submit this worksheet as a supplement to your submission of test data. This worksheet is not a substitute for submission of test data.

Property (a)	Mark (X) if provided	Page number (b)	Value (c)	Measured or Estimate (M or E)	Confidential Mark (X) (d)
Physical state of neat substance	X		X (s) ☐ (l) ☐ (g)	M	☐
Vapor pressure @ Temperature _____°C	☐		Torr		☐
Density/relative density	☐		g/cm3		☐
Solubility @ Temperature _____°C Solvent _____	☐		g/L		☐
Solubility in water @ Temperature _____°C	☐		g/L		X
Melting temperature	☐		220-250 °C	M	☐
Boiling / sublimation temperature @ _____torr pressure	☐		not applicable °C	E	☐
Spectra	X				X
Dissociation constant	☐				☐
Particle size distribution	☐				☐
Octanol / water partition coefficient	☐				☐
Henry's Law constant	☐				☐
Volatilization from water	☐				☐
Volatilization from soil	☐				☐
pH @ concentration _____	☐				☐
Flammability	☐		Flash Point >450°C	E	☐
Explodability	☐				☐
Adsorption / coefficient	☐				☐
Other - Specify	☐				X
Other - Specify	☐				X
☐ Mark (X) this box if you attach a continuation s					

Premanufacture Notice Electronic Continuation Sheet

Continued From: TS-CS11LU, Part II, Section B, 1(a)

Continuation Title: Locations of processing sites.

Insert narrative continuation here

Confi-dential: X

Insert any picture here (PDF)

Confi-dential:

Premanufacture Notice Electronic Continuation Sheet

Continued From: TS-CS11LU, Part I, Section B, 3.

Continuation Title: Identification of Impurities

Insert narrative continuation here

Confi-dential ☒

Insert any picture here (PDF)

Confi-dential ☒

☐

FRX polymers

MATERIAL SAFETY DATA SHEET (MSDS)

Section 1. Product and Company Identification

Product Name:	**FRX 100 Homopolymer**
Chemical Family:	Thermoplastic Polymer
Chemical Name:	Polyphosphonate
Manufacturer:	FRX Polymers 200 Turnpike Road Chelmsford, MA 01824
FRX Information Telephone:	978-250-4200 978-250-4533 (Fax)
Emergency Telephone:	800-424-9300 (CHEMTREC)

Section 2. Hazards Identification

Emergency Overview:

- Caution: Color: yellow/clear; Form: solid pellets; Odor: slight.
- Contact with hot material will cause burns.
- Irritating gases/fumes may be given off during thermal decomposition.
- Causes a slipping hazard when spilled.

Hazardous Materials Label Rating

Health	0
Flammability	0
Physical Hazard	0

0=Minimal, 1=Slight, 2=Moderate, 3=Serious, 4=Severe
*=Chronic Health Hazard

Primary Routes of entry:	Inhalation, Skin Contact, Eye Contact
Inhalation (Acute)	Gases and fumes evolved during the thermal processing or decomposition may irritate the respiratory tract
Skin Contact (Acute)	No absorption hazard when used normally Contact with heated material may cause thermal burns
Eye Contact (Acute)	Contact with dust may cause mechanical irritation
Chronic Effects of Exposure	No adverse chronic health effects expected
Carcinogenicity	No substances contained, as defined by IARC, NTP and/or OSHA

Section 3. Composition / Information on Ingredients

Hazardous Components	This material does not contain hazardous materials according to 29CFR1910.1200 (OSHA Hazard Communication Standard)

FRX polymers

Section 4. First Aid Measures

Inhalation	During heating, irritation may be caused by processing fumes and/or gases. If irritation develops, remove to fresh air. If irritation persists, seek medical attention.
Eye Contact	Flush eyes with tepid water for at least 15 minutes. If irritation persists, seek medical attention
Skin Contact	Wash with soap and water. If irritation persists, seek medical attention. Seek medical attention immediately for thermal burns

Section 5. Fire Fighting Measures

Extinguishing Media:	Water spray, foam, dry chemical, carbon dioxide.
Special Fire Fighting Procedures:	Full protective equipment, including self-contained breathing appartus (SCBA) must be worn when entering the fire area.
Hazardous Combustion Products:	Carbon dioxide, carbon monoxide, and phosphoric acid vapors are evolved during thermal decomposition

Section 6. Accidental Release Measures

Contain spills of molten material. If molten, allow to cool and solidify, and store in a marked, closed container pending a waste disposal evaluation.

Section 7. Handling and Storage

Storage	Store in a cool dry place.
Handling	Handle in accordance with good safety and industrial hygiene practices. Avoid breathing dust. Wash thorougly after handling.

Section 8. Exposure Control and Personal Protection

Exposure limits have not been established for this material or are not applicable

Engineering Controls / Ventilation	General dilution with fresh air is recommended. Local exhaust is recommended to limit exposure to excessive dust and thermal decompostion products.
Respiratory Protection	If airborne dust persists, wear a NIOSH-approved repirator. If using product at high temperature, choose respiratory protection based on an evaluation of airborne elements of thermal decompostion.
Skin Protection	When handling molten material, wear heat-resistant gloves.
Eye Protection	During normal handling, wear safety glasses with side-shields or chemical goggles. When handling molten material, wear face shield with chemical-resistant goggles

FRX polymers

After Use	Wash hands with soap and water after use. Wash hands before eating or drinking.

Section 9. – Physical and Chemical Properties

Physical State	Solid
Appearance	Pellets
Color	Yellow / Clear
pH	Not Applicable (NA)
Flash Point	> 450 ° C
Melting Point	220 – 250 ° C
Softening Point	90 ° C
Boiling Point, at 760 mm	NA
Solubility In Water	Insoluble
Vapor Pressure, at 75 degrees F.	Not determined

Section 10. Stability and Reactivity

Stability	Stable, will not burn
Reactivity	Not reactive under recommended conditions of handling, storage, processing, and use
Incompatibilities:	None known
Hazardous Decomposition Products	By fire and thermal decompostion: carbon dioxide (CO2), carbon monoxide (CO), and phosphoric acid vapors.

Section 11. Toxicological Information

No Information Available

Section 12. Ecological Information

No Information Available

Section 13. Disposal Information

Dispose of waste material in accordance with federal, state and local regulations.

Section 14. Transport Information

Land Transport (DOT)	Not Regulated
Sea Transport (IMDG)	Not Regulated
Air Transport (ICAO / IATA)	Not Regulated

Section 15. Regulatory Information

OSHA Hazard Communication Standard	Non-Hazardous
U.S. CERCLA (EPA) 40 CFR302)	No Components
SARA sections: 311,312,313	No Components

FRX polymers

Section 16. Contact Information

Contact Information:	FRX Product Safety Department
Telephone:	978-244-9500
MSDS Number:	FRX 100 Homopolymer
Revision Date:	04/14/2009
Revision:	2.0

The information contained herein is accurate to the best of our knowledge. FRX Polymers makes no warranty of any kind, expressed or implied, concerning the safe use of this material in your process or in combination with other processes.

Premanufacture Notice Electronic Continuation Sheet

Continued From: TS-CS11LU, Part II, Section B, 1(a)

Continuation Title: Locations of processing sites

Insert narrative continuation here

Confi-dential [X]

Insert any picture here (PDF)

Confi-dential [ ]

Premanufacture Notice Electronic Continuation Sheet

Continued From: TS-CS11LU, Part I, Section B, 3.

Continuation Title: Identification of Impurities

Insert narrative continuation here

Confi-dential [X]

Insert any picture here (PDF)

Confi-dential [X]

☐

Focus Report

New Chemicals Program

PMN Number: **P-09-0632**

Focus Date:	09/30/2009 11:00:00 PM	Report Status:	Completed
Consolidated Set:			
Focus Chair:	Loraine Passe	Contractor:	Paul Sohi

I. Notice Information

Submitter: FRX Polymers, Inc.

CAS Number: [redacted]

Chemical Name: [redacted]

Use: Flame retardant for [redacted] There are 7 references for the PMN material in file [redacted] of which refer to the PMN material as a flame retardant [redacted]. Analogs [redacted] and [redacted] 0 are flame retardant [redacted] P2REC: CRSS: forward. P2 Claim: The PMN material is a non-halogenated polyphosponate flame retardant polymer that addresses the need to replace the current commercial bromine-containing flame retardants that are being phased out due to environmental regulations.

Other Uses: [redacted]

PV-Max: [redacted] Kg/yr

Manufacture:

Import: X

II. SAT Results

(1) **Health Rating:** 1 **Eco Rating:** 1 **Comments:** ;

Occupational: **Non-Occupational:** **Environmental:**

(1) **PBT:** 3 1 1 **Comments:**

III. OTHER FACTORS

Categories:

Health Chemical Category:

Ecotox Category: [redacted] polymers

Related Cases/Regulatory History:

Health related Cases:

Ecotox Related Cases: Analogs: [redacted].

Regulatory History: NRC

CRSS P2Rec: [redacted]

MSDS/Label Information:

MSDS:

[redacted]

[redacted]

IV. Summary of SAT Assessment

Fate:

Fate Summary: P-09-0632

FATE: MW = [redacted]

[redacted]

[redacted]

Health:

Health Summary: Absorption is nil all routes (pchem). No significant health concerns.

Ecotox:

Ecotox Values:

Fish 96-h LC50:	*(P)
Daphnid 48-h LC50:	*(P)
Green algal 96-h EC50:	*(P)
Fish Chronic Value:	*(P)
Daphnid ChV:	*(P)
Algal ChV:	*(P)

Ecotox values comments: Predictions are based on SARs for [redacted] polymers; SAR chemical class = polymer[redacted]-phosphonate; [redacted]

Ecotox Factors:

Assessment Factor: 10
Concern Concentration:

V. Summary of Exposures/Releases

Engineering Summary:

Exposures/Releases			
Scenario			
Sites			
Media			
Descriptor A			
Quantity A (kg/site/day)			
Frequency A (day/year)			
Descriptor B			
Quantity B (kg/site/day)			
Frequency B (day/year)			
From			
Workers			
Exposure Type			

VI. Focus Decision and Rationale

Regulatory Actions

Regulatory Decision: PMN Drop Decision Date: 09/30/2009
Type of Decision:

Rationale: P09-0632 was dropped from further review. Human health and ecotoxicity concerns were low. This was a CEB D1 drop and subsequently an EAB drop.

P2 Rec Comments: P2 Claim: The PMN material is a non-halogenated polyphosponate flame retardant polymer that could be a replacement for current commercial bromine-containing flame retardants that are being phased out due to environmental and human health concerns.
The Focus participants agreed to forward this claim as a replacement for brominated flame retardants. The participants did have concerns that a component of the mixture, [redacted] could diminish the P2 potential of the PMN, since EPA has health concerns for [redacted].

Testing:

Final Recommended:

Health:
Eco:
Fate:
Other:

SAT Report

PMN Number: **P-09-0632**
SAT Date: **9/25/2009**
Print Date: **3/4/2015**

Related cases: [redacted]

Health related cases:
Ecotox related cases: Analogs: [redacted].

Concern levels:

Type of Concern:	**Health**	**Eco**	**Comments**
Level of Concern:	1	1	

Persistence	**Bioaccum**	**Toxicity**	**Comments**
3	1	1 Awaiting Human Health Entry Awaiting Human Health Entry Awaiting Human Health Entry	

Exposure Based Review:

Health: No
Ecotox: No

Routes of exposure:

Health: No exposures needed
Ecotox: No releases to water
Fate: ;

Keywords:

Keywords:

Summary of Assessment:

Fate:

Fate Summary: P-09-0632

[redacted]

[redacted]
Sorption to soils/sediments = v.strong
PBT Potential: P3B1
*CEB FATE: [redacted]

Health:

Health Summary: Absorption is nil all routes (pchem). No significant health concerns.

Ecotox:

Test Organism	Test Type	Test End Point	Predicted	Measured	Comments
fish	**96-h**	**LC50**	*		
daphnid	**48-h**	**LC50**	*		
green algal	**96-h**	**EC50**	*		
fish	**_**	**chronic value**	*		
daphnid	**_**	**chronic value**	*		
algal	**_**	**chronic value**	*		
Sewage Sludge	**3-h**	**EC50**	**_**		
Sewage Sludge	**_**	**Chronic Value**	**_**		

Ecotox Values Comments:

Factors	Values	Comments
Assessment Factor	10	
Concentration of Concern (ppb)		*
SARs	[redacted] polymers	
SAR Class	polymer [redacted] -phosphonate	
Ecotox Category		

Ecotox Factors Comments:

SAT Chair: L Keifer 564-8916